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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,671

03/29/2005

Itsuaki Katsumata

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02/16/2007

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EXAMINER

LEE, BENNY T

ART UNIT

PAPER NUMBER

2817

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/529,671

Applicant(s)

KATSUMATA ET AL.

Examiner

Benny Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March & 18 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>29 March 2005</u> . | 6) <input type="checkbox"/> Other: _____ |

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The disclosure is objected to because of the following informalities: Page 2, line 7, note that --as shown by the different curves in FIG. 16-- should be inserted after “increases” for clarity of description; line 21, note that --thereby-- should be inserted prior to “varying” for grammatical correctness. Page 3, line 23, note that “DISCLOSURE” should be rewritten as --SUMMARY-- for consistency with PTO guidelines; line 27, note that “thereby” should be deleted as being unnecessary. Page 12, line 18, note that “When” should be rephrased as --With reference to FIG. 2, when-- for clarity of description; line 25, note that --in FIG. 1-- should be inserted after “10” for clarity of description. Page 13, line 5, note that --(see FIG. 2)-- should be inserted after “32” for clarity of description. Page 17, line 22, note that --as shown in FIG. 8-- should be inserted after “time” for clarity of description. Page 18, line 5, note that “FIGS. 11 through 15” should be rephrased as --FIGS. 11 through 14-- for a correct characterization; lines 7, 8, note that “S1 through S11” should be rephrased as --S1, S2, S3, S4, S5, S6, S7, S8, S9, S10 and S11, as shown in FIG. 13-- for an appropriate characterization; line 16, note that --(see FIG. 12)-- should be inserted after “78e” for clarity of description. Page 18, lines 17, 24, & page 19, line 5, note that --(see FIG. 11)-- should be inserted after “80”, “81” & “78f”, respectively for clarity of description; line 22, note that “80a through 80d” should be rewritten as --80a, 80b, 80c and 80d-- for clarity of description. Page 19, line 1, note that “78a through 78d” should be rewritten as --78a, 78b, 78c and 78d-- for clarity of description; note that the second & third full paragraphs on this page should reference --FIG. 13--, which they describe. Appropriate correction is required.

The disclosure is objected to because of the following informalities: Note that for the specification description of the individual drawing figures, such description should describe, at

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least once, every reference number & label appearing in the corresponding drawing figure.

Some, but not all, examples of reference numbers and labels not described in the specification description are as follows: Fig. 1 “36”; Fig. 2 (14, 16, C); Fig. 3 (12, 22, 24, 34, 36, X); Figs. 4, 5, 6 (Frequency, C=C1, C=C2, C=C3); Fig. 7 (14, 16, 18, 20, 38, 40, 50, 52, A1, A2, A3, A4, C, Cv, K1, K2, X); etc. Clarification is needed. Appropriate correction is required.

The drawings are objected to because in FIGS. 15, 16, 17, 18, note that each drawing figure needs to be labeled as --PRIOR ART--.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is unclear whether the “same reactance” for the “first and second reactance parts” is intended to be the same as or is different from the “same reactance” for the “first and second reactance devices”. Clarification is needed.

In claim 3, it is unclear how the “variable reactance devices” (i.e. third and fourth variable capacitance devices) relate to the earlier recited “variable reactance devices” (i.e. the first and second variable capacitance devices as recited in claim 1). In other words, are the third and fourth variable reactance devices considered to be a part of the first and second variable reactance devices or are they separate devices there from. Clarification is needed.

In claims 4, 5, note that it is unclear whether each recitation of “a ceramic layer” is intended to be one on the same layer or a different layer within the “plurality of ceramic layers”. Clarification is needed.

The following claims have been found to be objectionable for reasons set forth below:

In claim 1, line 2, note that “being supplied with” should be rewritten as --receiving-- for clarity of description.

In claims 4, 5, line 2 of each claim, note that “stacked to form” should be rephrased as --stacked into-- for an appropriate characterization.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Waterman, Kim or Hampel.

Waterman (e.g. Fig. 1) discloses a variable phase skewer (i.e. variable delay line) comprising: a hybrid coupler (14) having an input branch (18) for receiving an input signal from signal generator (12); first and second branch segments (16) providing a 90 degree phase difference there between (i.e. an inherent property of hybrid couplers, which would have been known to those of ordinary skill in the art); extended branch lines (20) having identical stub patterns (24) connected to the branch segments (16) for providing reflecting of signals along branch segment (16); and an output branch (22) for receiving the reflected signals and outputting such signals. Note that each extended branch line (20) and identical stub pattern (24) provided a respective reactance part/device which inherently has the same reactance by virtue of its identical configuration.

Kim (e.g. Figs. 4, 6) discloses a variable impedance device (i.e. variable line or phase shifter in Fig. 6) comprising: a 3dB directional hybrid coupler (30) having an input terminal (33), an isolation terminal (34), coupling and through terminals (35, 36), which inherently provide a 90 degree phase difference there between by virtue of the 3 dB directional nature of the coupler (30); varactor diodes (31, 32) are electrically connected to terminals (35, 36) and the varactor diodes (31, 32) have the same capacitance characteristic, when controlled by the commonly applied DC control signal and hence inherently have the same reactance, thereby functioning as first and second reactance parts/devices.

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Hampel (e.g. Figs. 2B, 9C) discloses a reflection mode reflection phase shifter (i.e. functioning as a variable delay line/phase shifter), comprising: a quadrature hybrid (QDH) having input port (960), an output port (970 corresponding to the claimed isolation port) and two additional ports (not labeled) providing signals which are 90 degrees out of phase with respect to each other. Note that the additional ports are electrically connected to a “common sledge” (980), which inherently functions as reactance devices with respect to the corresponding additional ports. Note that by virtue of the “common sledge” configuration, the reactance at each additional port must inherently be the same and thereby the reflection mode phase shifter of Fig. 9C causes signals on the additional ports to be reflected back into the quadrature hybrid and outputted from port (970).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese ('703) reference (cited by applicants') in view of Kim.

Note that Fig. 13 of the Japanese reference discloses a variable phase shifter circuit (i.e. corresponding to a variable delay line) comprising: a hybrid circuit (1) including an input terminal (5), first and second output terminals (2, 3) and a third output terminal (6 corresponding to the claimed isolation terminal), and the hybrid circuit inherently functioning to provide a 90 degree phase shift for signals at terminals (2, 3), as would have been known to those of ordinary skill in the art; first and second "reactance circuits" comprised of a respective series connected combination of resonant circuits (7, 8), a fixed capacitor (10) and a variable capacitance (i.e. fourth capacitor 16 and first field effect transistor switch 11) which are electrically connected to each one of terminals (2, 3) as shown in Fig. 13. In operation, signals input into terminal (5) of the hybrid circuit (1) are reflected by the first and second reactance circuits (described above) at output terminals (2, 3) and are outputted through the third output port (6). The Japanese reference differs from the claimed invention in that it does not explicitly disclose that each reactance circuit provides a "same reactance", such as claimed.

Kim (Fig. 6), as described in the above rejection, discloses an analogous phase shifter circuit to that of the Japanese reference. Note of particular interest in Kim is that each variable reactance circuit (i.e. varactors 31, 32) are controlled by a common DC control signal to thereby provide the benefit of identical capacitance characteristics to each reactance circuit.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have modified the reactance circuits in the Japanese reference to have included a common DC control signal, such as taught in Kim, as applied to each of the transistor switches (11) in the

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Japanese reference. Accordingly, such a modification would have imparted the exemplary benefit of providing like characteristics to each of the variable capacitance circuits in the Japanese reference to thus provide the benefit of a same reactance to each circuit, in accordance with the teachings thereof in Kim, thereby suggesting the obviousness of such a modification.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the above rejection as applied to claim 2 above, and further in view of Matsumoto et al.

Note that the above combination meets the claimed invention except for the multi-layered stacked structure of components, such as claimed herein.

Matsumoto et al (e.g. FIGS. 2, 3A-3F) discloses a multi-layered stacked structure for arranging components and elements of a reflective phase shifter, analogous to the type in the above obviousness combination. In particular, note that the multi-layer stacked structure includes different layers for different components. For example, the top most layer mounts the discrete components, while other inner stacked layers support the coupler configuration.

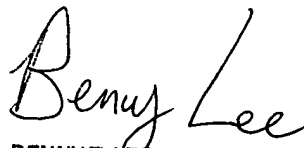
Accordingly, it would have been obvious to have further modified the above combination by realizing such a phase shifter in a multi-layered stacked structure, such as exemplarily taught by Matsumoto et al. Such a modification would have been an obvious substitution of an art recognized equivalent way to realize the specific phase shifter circuit of the combination, especially in view of the generic nature of the obviousness combination would have suggested that any equivalent way of realizing such a phase shift circuit (such as a multi-layered stack structure taught by Matsumoto et al) would have been usable therewith. It should be noted that as an obvious consequence of the further modification in view the teaching in Matsumoto et al, the resonant circuits and capacitors present in the phase shifter would necessarily have been

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disposed on "a layer" (e.g. the top most layer) of the stacked multi-layered structure, as to be commensurate with the phase shifter configuration of the obviousness combination.

Any inquiry concerning this communication should be directed to Benny Lee at telephone number 571 272 1764.

B. Lee


BENNY T. LEE
PRIMARY EXAMINER
ART UNIT 2817